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THE
PAST, PRESENT AND FUTURE
OF TUBERCULOSIS.

by
hbr. Fred. B. Shattuck *15 B.*

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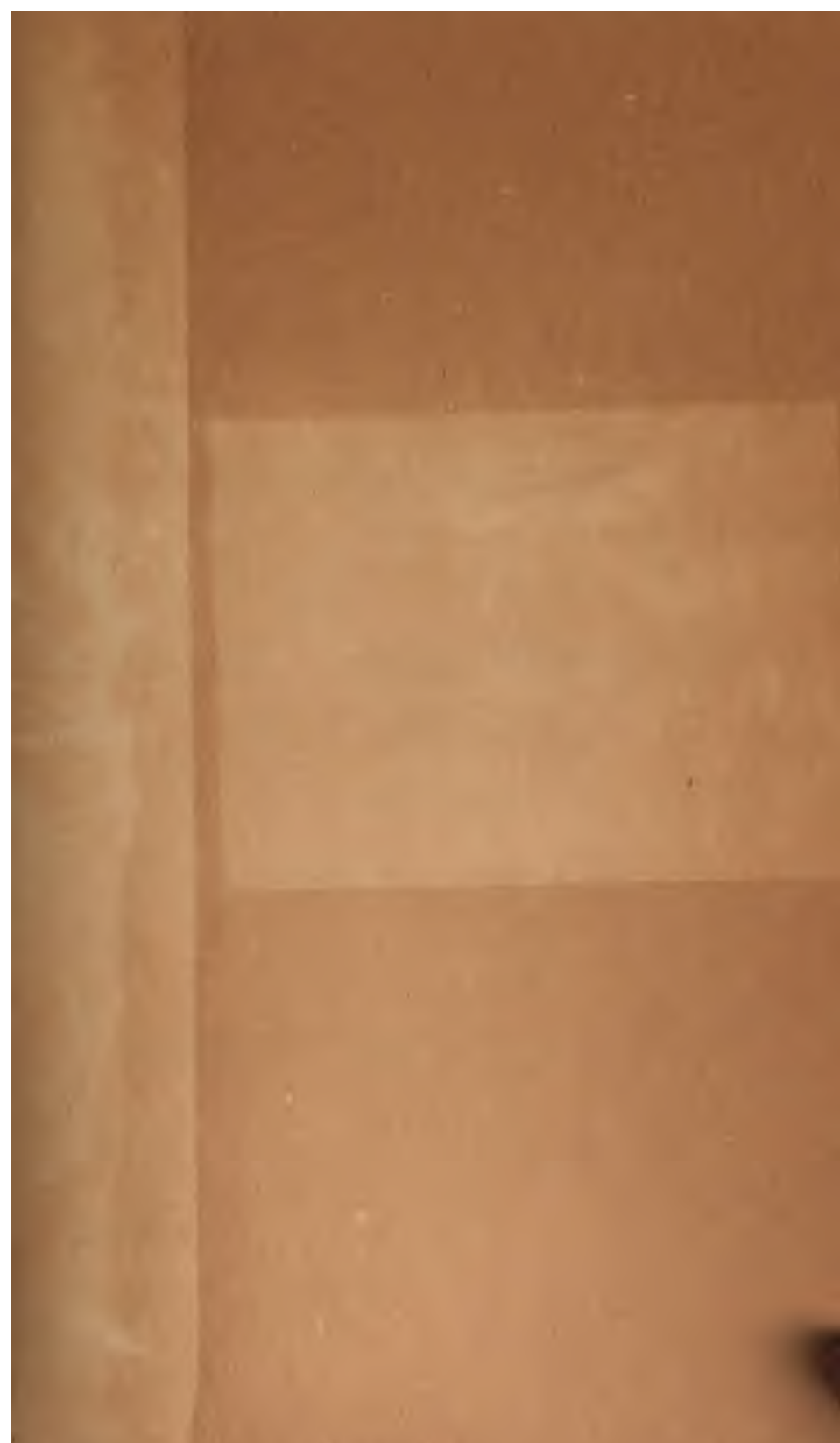
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THE SHATTUCK LECTURE.

THE PAST, PRESENT AND FUTURE
OF TUBERCULOSIS.

BY FREDERICK C. SHATTUCK, M.D.
OF BOSTON.

Delivered at the Annual Meeting of The Massachusetts Medical Society,
June 11, 1907.

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1907

THE PAST, PRESENT AND FUTURE OF TUBERCULOSIS.

THERE are obvious reasons why the honor of being asked to prepare the Shattuck Lecture is peculiarly grateful to me. The terms of the will under which the Society has established that Lectureship provide that the income of the bequest shall be applied to the "collection and publication annually of historical or other essays on the climate of said Commonwealth, on the diseases of its inhabitants and on such other subjects as the said Society or its government may select."

It is just one hundred years since Dr. Shattuck, having taken the degree of M.D. at the University of Pennsylvania, at that time the chief medical school of the country, settled in Boston. His father, Dr. Benjamin Shattuck, was a country practitioner in Templeton, Worcester County, an A.B. of Harvard in 1765, but apparently had no degree of M.D.; there being no institution in the country at that time capable of granting it, and his circumstances not permitting him to cross the water to secure it.

His life was arduous and was brought to an end at fifty-three, I believe by tuberculosis. This disease also proved fatal to Dr. George C. Shattuck's first wife, probably to one or more young children, certainly to a daughter of twelve. Of seven children, the eldest alone grew up and married. Families of old New England stock are smaller to-day than formerly; but infant mortality is far less among

them, so that the actual decrease in this stock is probably not as great as the smaller number of children would seem to indicate. However this may be, certain it is that the rigorous, changeable climate of New England has long had an evil reputation as being favorable to tubercular disease. This fact, in connection with the loss which consumption inflicted upon Dr. Shattuck's family, his desire to do what he could to make his beloved State healthier and happier, and the prominence which the prevention and cure of tuberculosis has assumed of late years in this community, as well as throughout the world, determined me to choose as my subject for the evening, "The Past, Present and Future of Tuberculosis." The subject may be well worn. It is, however, of vital interest, and I do not feel that I shall wear it out whatever the effect of my remarks may be upon you.

Tuberculosis is no modern disease, its most frequent form and localization in the lungs—consumption—having been recognized and dreaded alike by the profession and the laity in the remotest times of which we have written record. And yet so universal and constant has been its presence in settled and civilized communities, so steady, sure and apparently unavoidable its ravages, that familiarity, although it did not breed contempt, did breed a certain indifference. Until the most recent times it was regarded as one of the manifestations of the inscrutable will of God, almost inevitably fatal,—a part of the necessary order of nature.

Kismet was on the lips of Christian, Jew and Mohammedan alike with regard to consumption. Thus, although dreaded, it was—and is—far less so than those infections which visit us only from time to time and to whose presence and effects we have thus not become so accustomed.

Hippocrates defined consumption as the disease the most difficult to treat and that which proves fatal to the greatest number.

Isocrates, about 400 B. C., is said to have been the first to write on the transmissibility of consumption by contagion.

Areteus, about 250 B. C., recommended sea voyages for consumption.

Two hundred years later Aritæus, the Cappadocian, thus described the appearance of the consumptive: "voice hoarse, neck slightly bent, nose sharp and tender; cheeks lean, prominent and red; eyes hollow, brilliant and glittering; swollen, pale or livid in the countenance, the slender part of the jaws resting on the teeth as if in smiling, otherwise a cadaverous aspect."

Celsus, early in the first century A. D., advised change of air and outdoor life for phthisis. Let us note in passing that Celsus was a layman who set forth the medical knowledge of his time and of whose encyclopædic writings those on medicine have alone come down to us.

Galen held that phthisis is an infectious process; that there is danger in living with those affected by it. Then came the long, dark night of the Middle Ages when learning, so far from advancing in Europe, fell into a decline, barely kept alive by the monks until the Renaissance. Even the monks, however, devoted themselves to the Latins rather than the Greeks, and were interested in theology and religion, scarcely at all in natural science.

The Arabs, however, revered and tended the lamp of science lighted by the Greeks, and passed it on to the Moors of Spain, and the influx of Byzantine scholars into Italy after the fall of Constantinople greatly stimulated the awakening interest in Greek thought in that peninsula whence it spread northward.

Avicenna, the Arabian, in the first half of the eleventh century, believed consumption to be one of the diseases which spreads from man to man.

Six hundred years later, Fabricius Acquapendente writes, "Celsus amongst the Latins, Paulus Ægineta amongst the

Greeks and Albucasis amongst the Arabs form a triumvirate to whom I confess that I am under the greatest obligation."

Montani in 1550 called consumption one of the most contagious and easily contracted of diseases. With the Renaissance came dissection illuminating anatomy and pathology.

Silenius first demonstrated the association between tubercles or nodules in the lungs and phthisis.

Morgagni would not perform an autopsy on one dead of tuberculosis, and was influential in having regulations passed by the municipal authorities to control the disease.

Antonio Cocci in the first half of the eighteenth century advised the use of sputum cups, and urged the whitewashing of all close, small rooms in which a consumptive had lived. If the room was large and sunny less rigorous measures were deemed necessary.

Lazarus Riverius dwelt on the contagiousness of phthisis and notes its spread throughout an entire family by heredity or contact.

Michel Peter, writing about 1600, says, "I know of nothing more hideously fetid than the bedroom of a rich consumptive. It is a spot carefully enclosed where both air and hope are alike forbidden to enter. There are sandbags to doors, sandbags to windows, thick curtains envelope the bed where the unfortunate consumptive swelters in perspiration, and an atmosphere twenty times respired, twenty times contaminated by contact with his own diseased lungs."

The Dauphin of France, only son of Louis XV. and father of Louis XVI., died in 1765 of consumption. About a year later his wife died of undoubted consumption as shown by the autopsy, probably contracted through her devotion to him. About two months before her death Tronchin, the favorite pupil of Boerhaave, the physician and friend of Voltaire, a man who applied common sense to

medicine, relying on hygiene rather than on bleeding, purging and puking, was called in. In the palace at Versailles it was the custom to close as tightly as possible all windows from November first (All Saints' Day) to Easter. Tronchin found the air of the room so foul that he ordered the windows opened, exclaiming, "The Princess is poisoned." Malice and jealousy perverted the meaning of this remark, which won him the implacable hatred of the Duc de Choiseul. Tronchin was put in charge of the case, fed her generously, insisted on fresh air, made her walk and drive. At first, she improved, the fever abated, and she slept without drugs; but the disease was too far advanced, lighted up afresh, and she did not long survive a large hæmoptysis. A storm of abuse was heaped upon him by the profession. He was called the "worst of charlatans," and was accused of cutting short the life of his august patient by a treatment "as fantastic as murderous." Tronchin is not as well known as he deserves to be, having published nothing on medicine except a monograph on lead colic, which might have been better done. A memoir of him by a descendant was published in 1906 and should be widely read.

In 1760 a hospital was erected at Olivuzza for the accommodation of phthisical patients. In much more recent times the Italians especially, their country being sought by well-to-do consumptives from Great Britain and America, were accused by us of superstitious cruelty towards these patients, the friends of one who there succumbed to his disease being put to great inconvenience and expense during the last illness and the freshness of their grief.

In 1803 Chateaubriand wrote from Rome to a friend concerning the death from consumption of Madame de Beaumont: "I am in great difficulty. I had hoped to get 2000 crowns for my carriages, but phthisis is declared in Rome a contagious disease, and as Madame de Beaumont drove two or three times in my carriages, nobody is willing to buy them."

The great Laennec himself succumbed to the disease, the recognition and pathology of which he had done so much to further. There seems no doubt that Goethe also had consumption and finally died of it.

It may be broadly stated that until within fifty years both the public and the medical profession regarded phthisis as incurable. Efforts were practically confined toward making the patient comfortable and prolonging his life, in a small way toward preventing the spread of the disease, seldom toward curing it.

Early in the nineteenth century, a French doctor, more hopeful than the rest, wrote, "there are two kinds of consumption: that of the rich which is sometimes, and that of the poor which is never, cured."

It is an interesting fact that the two men who stood at the head of medicine and surgery in this community during my student and early professional life had both been tubercular as young men; but both lived to the due age of the Psalmist, and both died of other diseases. I was privileged to hear from the lips of the late Dr. Edward H. Clarke an account of a massive pulmonary hæmorrhage he had between Bagdad and Damascus while travelling for the benefit of his health.

Very great importance was attached to hereditary predisposition, and, diagnosis being less prompt and treatment less rational, the outlook for recovery was indeed gloomy.

I well remember in 1874 hearing a French physician, with whom I was making a visit at the Hotel Dieu at Lyons, remark, "Messieurs, pour la phthisie il n'y a que deux remèdes, l'opium et la menterie."

I also heard the late Dr. H. I. Bowditch say that he valued his service at the City Hospital especially for the reason that it helped and strengthened him to see patients get well under his care. You remember that he was the first and leading specialist of his time in Boston in thoracic disease.

Those who could afford to leave home went to Italy, Madeira, Egypt, the Riviera. On this side of the water, Havana, Savannah, Charleston were the main resorts. Dr. John T. Metcalfe during the Civil War gave Nassau vogue, and later started Thomasville, Georgia. He was not a consumptive as have been so many physicians identified with this or that place which they found helpful to themselves and made so to others.

Did time permit it would be interesting to dwell somewhat on the change of view with regard to the essential element of climate for consumption. Warmth and equability to minimize the risk of taking cold were in the ascendant up to about 1860. Then the equable though cold winter climate of Minnesota came into some vogue. Then equability fell from grace, and altitude combined with dryness and sunshine took the first place, especially for incipient cases. We now realize that climatic change, though in some cases very desirable, is not a *sine quâ non* of cure.

Bowditch and Buchanan simultaneously and independently called attention to the relation of soil moisture to the prevalence of consumption, a relation now not much credited.

Some individuals were saved; some had their lives prolonged, yet the general hopelessness of the disease was admitted though the post mortem evidence of puckered and scarred apices had long been known but had failed to teach its full lesson.

It seems to me that ignorance of the pathology of tuberculosis was largely responsible for failure to advance at the clinical end. Laennec upheld the unity of tuberculosis; but the microscope led men astray at first, inducing them to confuse distinctions with differences. We had the desquamative pneumonia of Buhl, the catarrhal pneumonia of Niemeyer, and the dictum of the latter that the greatest danger of the catarrhal pneumonic, that is, consumptive, is

that he become tubercular. We thus wandered in a maze of theory, based on observation it is true, but still theory, for years after Villemin in 1865 proved that the advocates of the infectiousness of tuberculosis were right, and made a step toward establishing the true criterion by which tuberculosis is to be recognized. For clinching knowledge as to this criterion we had to wait then nearly twenty years for Robert Koch and his masterly proof that a special bacillus is the sole cause of tuberculosis, and the indispensable factor in the production of all the multiform changes we had classed as consumption, lupus, scrofula, white swelling, hip and spine disease, etc.

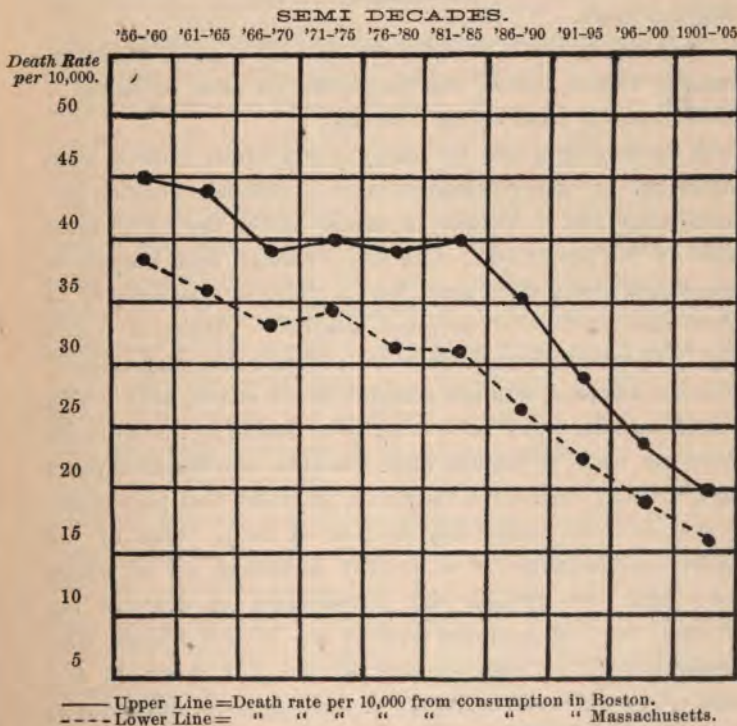
The year 1882 marked a great era in medicine and may be regarded as dividing the past from the present of tuberculosis. We then for the first time began to see clearly, having found the cause, what we had to combat, and could begin to plan the intelligent campaign in which the civilized world is now engaged. The individual who was willing, bravely and cheerfully, to follow the directions of a wise physician and could also afford to do so, had a good chance fifty years ago, though in two respects particularly his chance has improved. His disease is recognized earlier,—a great thing in itself,—and his facilities for securing the prime *desiderata* for recovery are more varied and better.

A sharp contrast between the past and the present of tuberculosis lies in that good hope for recovery is extended from the exceptional to the average individual; in that we recognize and can minimize the danger of the spread of infection; in that, knowing the cause of the disease and its mode of infection, by intelligent and concerted action we can prevent as well as cure. We knew that general hygiene was of the utmost value in the prevention and cure of tuberculosis just as we knew that stagnant water and defective drainage stood in some causative relation to malaria. The discovery that an infected mosquito is the necessary link in

the chain of causation of malaria enables us to act intelligently and efficiently, instead of gropingly and inefficiently, along preventive lines, our cure of the disease in the infected man being practically no better than it was before Laveran discovered the plasmodium malariae.

Let us not forget that a tent on the roof, a shed open to the sun and fresh air in the backyard of a city house, camp-life in the woods, are not "all that there is of the most modern," as the French say.

CHART SHOWING DECREASE IN DEATHS FROM CONSUMPTION
IN MASSACHUSETTS AND IN BOSTON.



As appears clearly in charted form, mortality from consumption was dropping gradually in this State from '55 to

'85, since when the drop has been more steady and somewhat more rapid. It is interesting to compare the mortality in Boston with that in the State. From '55 to '65 it fell from 45 to 40 per ten thousand; then was stationary for twenty years, and since '85 has steadily dropped from 40 to 20. The constant influx of immigrants, many of them vulnerable, and their subjection to the adverse influence of urban tenement-house life and its adjuncts may, perhaps, account for the failure of the death rate to decrease in Boston between '65 and '85, while the more rapid fall in mortality since 1885 may well be due to the measures of prevention and cure which are more apt to start in the larger centers.

It is safe to say that formerly scarcely a prominent and wealthy Boston family was free from its case or cases of consumption, often called "decline."

A century ago, and for many years after, women were subjected to many disadvantages. Robust health was hardly ladylike. Fashion in custom and in dress kept them indoors far too much. Outdoor exercise was limited to horseback riding for a very few, a drive or a social call at short distance on foot in good weather. Athletics would not have been tolerated for women even if they had existed. Female footwear was not adapted to the street, still less to country roads, and I have it on good authority that drawers were not worn by women until less than one hundred years ago, it being considered indelicate to clothe that part of the person so nearly after the manner of men. One of the numerous daughters of a wealthy merchant, all of whom long held out against the introduction of drawers for women, was remonstrated with by one of her friends who remarked, "But suppose you should fall down in the street," to which she replied, "*A lady* does not fall down in the street." It is not in flippancy of spirit that I mention these facts. They seem to me to throw an interesting side-

light on the times, and to give a hint as to why practically none of the descendants of those families die of consumption at present. Now and then one gets the disease, but it is promptly recognized and almost invariably cured. It is, however, time to leave the past and to let the dead bury their dead.

Strengthened by and relying on modern knowledge, we are now engaged (I), in the prevention of tuberculosis in all its forms, and (II), the cure and care of those now infected by it.

I. As already stated, it is in prophylaxis especially that we have gained by Koch's discovery. A few words must therefore be said on the mode of infection. The seed is the bacillus of tuberculosis; it is virtually omnipresent in civilized and settled communities; it succumbs readily to sunshine. How long it may retain its vitality in houses, fabrics, etc., we do not know, perhaps not as long as is often and by many believed. Theobald Smith tells me he cannot keep a culture alive more than three months even under conditions most favorable to the longevity of the organism. To his published work and ready kindness in imparting his knowledge I may here express my indebtedness. We are all his debtors. The bacilli of human and bovine tuberculosis are separate organisms today even if they may have had long ago a common ancestor. The bovine form occurs practically only in young children, is rare in them, and the risk of its communication from cattle to man is very small unless the udder is tubercular. Under no other condition can a sufficient number of bacilli gain entrance to the milk to prove harmful. The meat is safe as food. It is therefore irrational, unlimited funds not being at our disposal, to kill all cattle, otherwise well, which react to tuberculin. Much less money intelligently spent in dairy inspection, enforcing cleanliness, detecting and eliminating emaciated and sick cows, will serve all necessary prophylactic purposes.

Tuberculosis itself is very rarely congenital, so rarely that for practical purposes we can leave this mode of infection out of account. Whether the seed of adolescent and adult tuberculosis is planted in childhood, reaching the blood stream and lungs *via* the tonsils and intestines, as is held by so many of the French and by Behring, or not, is somewhat apart from the broadest view of prevention. In so far as they believe the implantation to come from milk they are probably wrong, the non-identity of human and bovine tubercle having been apparently proved. All floors are not clean. Babies in crawling and walking are close to them, and like dogs they are not over-particular as to what they put in their mouths. The seed lives in man and must be able to get from one man to another, to change its dwelling, in order to persist. Its vehicle is the sputum in the vast majority of cases. It is therefore by efforts tending to prevent the preservation and diffusion of the sputum of those affected that we can most simply and efficiently limit the supply of seed, which furnishes such a rich harvest to the Great Reaper. It is fortunate that a remedy which must be generally applied is so simple,—really within the reach of the lowest intelligence and the most slender purse. The community as a whole is rapidly learning its interest in the care of sputum. The individual is, probably less rapidly, awakening to his duty, first, as a member of a family; second, of the community. We must continue to diffuse this knowledge and to enforce as fast and far as we can action in accordance with it.

The only way to absolutely eradicate tuberculosis lies in total destruction of the seed, a conceivable rather than an attainable possibility. It is notoriously a seed which flourishes on poor soil. Whether poor from the start—congenitally poor—, run out in one or more of a thousand ways, or both together, matters little for practical purposes, save that the children of families with a strong tuberculous taint

must be tended with extra care and wisdom. Therefore an important part of prophylaxis is to so enrich the soil, that is to so increase the resistance of every member of the community, that such seeds as may gain lodgement will die without issue, or, at all events, without extension. Thus everything which tends to improve public health is helpful—cleanliness; good and sufficient food, well prepared; pure and ample water supplies; public parks and baths; children's playgrounds; legal restraints upon the greed and stimulation to the inertia which neglects the hygiene of tenements, workshops and factories; cultivation of a taste and provision for the means of outdoor exercise and recreation. These are far from being all, though they are among the most important agencies uplifting the public health. It is to them that the decreasing mortality from consumption up to 1885 is to be exclusively credited. Nothing like an accurate apportionment can be made of the relative value of seed destruction and soil enrichment since that date. Seed destruction is a new factor within twenty years; but during this same period we have seen ever-increasing attention to hygiene in all its branches, especially on the part of the State and the municipalities. The golf course and tennis courts in Franklin Park, the ocean pier at South Boston, public baths, the medical inspection of school children—imperfect as it is as present—these are straws which show the way the wind blows. Straws they are too in another sense, threatening to break the back of that patient camel, the city taxpayer, burdened with an extravagance—or worse—of expenditure, which no private business could or would tolerate. Quick transit tends to diminish the density of urban population. Corporations, partly under the pressure of public opinion and legal enactment, but also from the mingled motives of justice and self-interest, improve the conditions of their employees. Public-spirited and benevolent citizens are forming new organizations, and are also

as individuals helping along the work. All indications point to great vitality in these influences making for the public weal. Individualism, the saving grace of fifty years ago, has been weighed in the balance and found wanting. Its antithesis, socialism, is advocated by some and feared by others, though the soil of the United States is probably less fitted for it than any other on the globe. The legal maxim, *caveat emptor*, is confronted by pure food and other laws limiting the freedom of the individual for the greater good of the community. The individual must be ready to forego privileges, some of them perhaps innocent as far as he alone is concerned. President Eliot well said in a recent address that it is in co-operation that we can attain the best results, and nowhere will co-operation enriched with public spirit yield a richer harvest than in, wisely and along broad lines, striving to prevent tuberculosis.

Among prophylactic measures, those of which Grancher may be regarded as the parent in France must be mentioned. In that country the belief is widely held by physicians that tuberculosis is usually contracted in infancy and childhood, even if it does not develop until adult life. Grancher and his wife started the movement to remove the children of tuberculous parents with their consent to country houses or sanatoria until the children are strong enough to resist the disease. It is claimed that fifty per cent. of those children are cured. There are only two such sanatoria on our greatly extended seacoast. Children with enlarged glands—tubercular—and those debilitated from any cause,—pre- or potentially tubercular—are followed up to their homes and either removed to “Ecoles de plein air” or built up at home by generous diet and instruction of the parents in general hygiene. It has been found far better to enlist the interest and intelligent co-operation of parents in better feeding at home than to furnish milk and eggs and the like

at school. This work is growing rapidly and is in private hands, not, as is usually the case on the Continent, under governmental control or pay.

The proposed extension of medical inspection of the Boston school children and a detail of nurses to visit and teach the families could render great service along these lines, and may, it is hoped, spread widely and rapidly.

II. We now pass on to a brief consideration of the measures at present under trial for the cure and care of those not only infected but diseased. As Theobald Smith keenly observes, infection and disease are not quite one and the same thing. A person may be infected—harbor the bacilli of tuberculosis perhaps indefinitely—and yet remain perfectly well. He is not diseased, strictly speaking, until the infection spreads locally or generally.

Perhaps clearness may be promoted by the rough separation of the advanced and the early cases. I say rough advisedly, inasmuch as the best means to combat tuberculosis is a new subject, experimental, somewhat chaotic, rapidly developing. The leading principles are fairly clear; but we are to learn how to apply them to existing conditions in a decentralized country composed of forty odd sovereign states, presenting often wide divergencies in climate, industries and other important respects, not only between but also within each other.

Measures desirable in and applicable to Germany, for instance, may be entirely out of place in this country. It is in some regards easier to classify for the future than for the present.

Cure can be expected in very few of the advanced cases. In such we may aim at prolongation of life, promotion of comfort and the safety of others.

In the well-to-do the disease is usually recognized early and pretty well cared for at the present time. Among cleanly people with reasonably spacious, sunny, and airy

quarters, the risk of the spread of infection is very small. This appears clearly from the experience of the older hospitals and sanatoria for consumptives in Germany, England and this country. In such hospitals it is not common for attendants to acquire the disease, though Dr. James Minot tells me that six nurses have developed consumption at the Long Island Hospital since 1896. They all entered the training school with a physician's certificate of good health. He does not know whether or not they were examined soon after their arrival upon the Island. City politics are killing to body and soul alike.

Dr. Nichols, however, writes me that during the fifteen years he has been connected with the State Hospital at Tewksbury, one physician can reasonably, and two officers possibly, be supposed to have contracted the disease there. He also states that he has never had any evidence of the spread of the disease from one patient in the Institution to another; and yet during the first half of this period segregation of consumptives was very incomplete, and those exposed, being paupers, were presumably not up to the average standard of resistance. Those who wish so to do can contrast here Boston and the State.

In the House of the Good Samaritan for over fifty years half the adult inmates have been consumptives, generally advanced cases, and no attempt at segregation was made until removal to the new building two years ago. During this half century among all employees one nurse alone contracted the disease within the walls as far as is known. A good illustration of what can be done even under very unfavorable conditions is afforded by the so-called "lung block" in New York. It is in the most congested and crowded district in the world, the ward containing it averaging four hundred and seventy-eight human beings to the acre. This block alone holds nearly four thousand people, of whom some four hundred are babies. It is closely

packed with huge grimy tenements which are honeycombed with rooms. Light and air have been slowly shut out to make more rooms. Walls, courts and air-shafts are cramped, deep and sunless. The body of the block is packed with Jews, Irish and Italians, with a sprinkling of twelve other nationalities. Owing to the comparative immunity to tuberculosis among the Jews there are relatively few cases of consumption in this block in their race. One house called the "Ink Pot" has front and rear tenements five floors high with a foul, narrow court between. Here live one hundred and forty people of whom twenty-three are babies, and here the plague thrives in darkness and filth,—filth in the halls, over walls and floors, in sinks and closets. On the ground floor in one corner where there is apparently little sun and light lives a German family who have kept their windows opened and their rooms well-aired and spotlessly clean. They alone have escaped the disease. Practically every other tenement in the block has had its case of consumption.

It is of the utmost practical importance that the public should clearly understand that while tuberculosis is infectious its infectivity is slight, provided that simple precautions are taken.

Advanced cases, among those who, though not well-to-do, can still provide for themselves reasonably well and therefore usually stay at home, are a very important class to find, educate and follow up to see that they and those with whom they live practice what they are taught. Advanced cases among the very poor, who require so much personal attention, to say nothing of such food and hygiene, as their families and friends cannot provide, are best cared for in hospitals, public and private.

At the State Hospital at Tewksbury, Dr. Nichols writes me under date of March 25th, there are two hundred and forty-seven cases of tuberculosis: In a special building

and neighboring camps and shacks, half a mile from the main hospital, one hundred and sixty men are cared for ; but the cases have been sent in such numbers this winter that it has been necessary to put about thirty men in the earlier stages of the disease in the regular hospital wards. Dr. Nichols is asking the Legislature for an addition for fifty patients to this building, merely to meet present and urgent demands. A building for female consumptives, also more than half a mile from the main buildings, will be ready for patients this spring. This is the only public State provision at the present time in Massachusetts confessedly for advanced cases ; and to enhance its usefulness, the Legislature a year ago so changed the law as to allow its benefits to consumptives without thus making them legal paupers. The Boston Hospital for advanced cases will be opened before long. There are a few private institutions solely for advanced consumption. There are others which receive such cases in common with other more or less incurable chronic diseases. The present provision is quite inadequate. It is true that less than one-third of the cases at the Rutland Hospital belong to the incipient class. Although it was for that class that the Hospital was designed, not enough incipient cases apply to fill the beds, and more advanced cases are therefore taken. For this state of affairs the Resident Physician blames the medical profession in that it too often fails to make an early diagnosis. This blame is probably in the main deserved, though we all see patients who seek no medical advice until they have passed well beyond the incipient stage. The number of these cases will doubtless steadily diminish in the near future.

The present provision for less advanced and early cases in this State may be classed under :

1. Sanatoria.
2. Dispensaries.
3. Day camps.
4. Tuberculosis classes.

The sanatorium treatment dates back to 1854, Brehmer of Goebersdorf succeeding where Bodington had failed. The latter should be accorded the tardy credit which he did not receive during his life. In 1840, he, "an obscure country practitioner of Warwickshire," published an essay on "The Cure of Pulmonary Consumption on Principles Natural, Rational and Successful," based on the case of a young girl whose faith in him prevailed against the most strenuous opposition of her people and who passed her days, even in winter, out of doors on donkeyback. Although at first her cough was worse, she persevered, recovered, and lived to be eighty-one years of age. He built an institution within which to carry out his ideas, but could not hold out against universal opposition and transformed it into an insane asylum where he later died—a tragic story. Time does not permit even a brief history of the sanatorium movement, but I cannot forbear to mention Dettweiler, Trudeau and Vincent Bowditch. The first sanatoria were private, and our State took the lead in public provision for early cases at Rutland. It will not be many years before every State has one or more such centres, and the movement is now spreading to cities and town.

It is natural that provision should be first made for early, presumably curable, cases. "What can't be cured, must be endured." We like to see prompt results. The educative value of sanatoria for incipient cases is at present great. Every inmate learns what the effective weapons are for fighting his disease and how to use them. After his discharge this knowledge filters, more or less clearly, through him to others who stay at home, and also teaches him, and through him others, how to live without risk to the well. We already see, however, indications of a spreading belief that the greater need is for hospitals to receive advanced cases with disabling and incurable disease, and whose circumstances are such that they cannot at home

receive the care which ordinary humanity demands, or be safe companions for the healthy. The State Commission on Tuberculosis has just recommended the Legislature to establish three hospitals in different parts of the Commonwealth for such cases. It does not advise any more provision for early cases. Institution life at best has serious disadvantages, particularly for those but partially or slightly disabled. Such degree of productive or useful occupation as strength permits is conducive to health. This is difficult to secure in connection with sanatorium life, and it has been suggested that some kind of farm work be an adjunct to Rutland for those who are fit. This can only be carried out during a limited part of the year. An objection common to health resorts and sanatoria alike, whether for the rich or poor, lies in the congregation of considerable numbers of persons suffering from the same disease, and in tendencies to a mental state resulting therefrom. The person who stays at such a place longer than his disease and circumstances in a large sense really demand from that moment gets harm physical, mental, or both. Here, as everywhere in medicine, we must individualize as far as we can, and we can often do so farther than seems possible if we will only compel ourselves to the hard work of thinking.

Such luxurious provision as is made in some of the German institutions is neither necessary nor desirable. It is sheer extravagance begotten of too much money, analogous to that of some of our life insurance companies which have been so cussed and discussed of late. Just as we have begun to see that climate is only an indirect means for the treatment of cases of tuberculosis; that there is no part of the world where the disease does not exist, if favorable conditions are present or are introduced, great advance is made in home treatment, which must and should be the only treatment for the great majority of cases.

This brings us to the tubercular dispensary of which Philip of Edinboro was the founder in 1887. The Royal Victoria Dispensary was not only the first of its kind but is so complete today as to serve as a model.

The Edinboro organization aims to provide:

- (1) A place where poor patients can be examined;
- (2) Where bacteriological examinations can be made;
- (3) For instruction of patients;
- (4) Dispensary for drugs, disinfectants, food, etc.;
- (5) Visits in homes of patients by
 - (a) doctors;
 - (b) nurses;
- (6) Means for the selection of early cases for sanatoria and late cases for hospitals;
- (7) For the general guidance of patients and their friends, to answer inquiries from all interested persons on every question concerning tuberculosis.

There are four doctors (one is paid \$300 a year), a trained nurse, a volunteer Samaritan Committee of ladies who look after school children and families of patients. There is a paid employe on the premises who helps take histories, etc. The dispensary costs \$2500 a year. Interest has been awakened in other cities and towns. There is now a sanatorium for early and a hospital for advanced cases. To complete every such organization, there should be colonies—or some means of keeping track of the after life of arrested or cured cases, and of getting them proper employment, etc.

Calmette at Lille in 1900 opened the Emile Roux Anti-tuberculosis Dispensary. His idea has been taken up in Germany especially by Van Pütter and Kayserling, where numerous cities have opened so-called "Fürsorge-stellen," "Care and Advice Stations." Here instruction is given to patients who must live at home; sputum examinations are made, food and medicine are given when necessary, and

visits are made in the homes of the patients themselves. In Boston in 1899 at the Boston Dispensary this idea was adopted. The Phipps institution, opened in Philadelphia in 1903 through the generosity of Henry Phipps and under the guidance of Laurence Flick, does this on a more thorough scale than almost anywhere else. In New York the Department of Health Clinic for the treatment of Communicable Pulmonary Diseases, established in 1903, is the best example of such work under municipal authority.

Recently in Boston the system of tuberculosis classes has been introduced, and thanks to the enthusiasm and devotion of Doctors J. H. Pratt and J. B. Hawes, 2d, and Cleveland Floyd, is bearing most promising fruit. This gives a large amount of care to a small number of patients, the reverse of what is done in most dispensaries. The "class" is a unit which can be indefinitely increased. Five such classes have been formed in Boston, two in New York, and one each in Cambridge, Providence, Brockton, Lynn and Baltimore.

Philip of Edinboro and Calmette of Lille are the two great names in dispensary work. Calmette's are called Preventoriums. Besides giving milk, eggs, etc., to poor patients, in some instances the rent is paid, it being considered a good investment.

Day camps originated in Berlin—"Walderholungsstätte," founded by Dr. Becher. Insurance companies pay for the food, and railroads give special rates to and from the camps, two cents for eight miles. These camps are for patients too advanced for sanatoria or who for some reason or other must live at home. There are two such in Boston, the only two in America. Berlin has three, the only ones in Europe.

The weapon against tuberculosis is education: education as to how it is spread, how prevented; how treated for cure and alleviation, and for safeguarding the community. The

campaign is on. Earnest, devoted leaders have come forth from the profession, working with small thought of money return. The public is ready to help, to co-operate with brains, time, money, service. Are we doctors as a body doing our full share? I doubt it. Too many of us I fear—I myself cannot enter the plea of not guilty—are more or less afflicted with inertia, congenital or acquired. There is a large supply of enthusiasm everywhere among the laity, which only needs the direction of physicians to bring new land under cultivation as well as to increase the yield of that already planted.

We cannot realize too strongly that everything which tends to elevate the public health, directly or indirectly, makes the struggle for existence of the tubercle bacillus harder. At one or another place in the world almost every necessary specific step for prevention or cure is taken. One place or country has given spécial attention to one branch of the work and gone far in it; another to another branch. Some places have done little; too many nothing. The work of the immediate future, therefore, would seem to lie in generalizing and systematizing the work in conformity with the varying modes of government and administration of each country and independent state, with due consideration of its customs, conditions, industries, *et cetera*. Modification of details must be made to meet the different demands of large cities, the factory town, the village and rural community. Just as good results can be secured where local self-government prevails as under a centralized and paternal system; but people must be made to see their importance and to desire them, securing proper legislation and ordinances, and providing means for the enforcement of the same. In our own State, the work for the immediate future would seem to lie in:

1. The passage of a general law making the reporting of consumption compulsory. But no such law can be thor-

oughly efficient unless the medical profession as a whole is competent to make an early diagnosis, and is in such sympathy with the law that the physician puts obedience to it and its underlying principle above the selfish preference of this or that patient and above any fear that he may lose practice by reporting him. It is not likely that such opposition will be very serious or long-lived.

2. Laws providing for the disinfection of dwellings occupied by the consumptive after moving or death.

3. An extension of the anti-spitting law, so as to include at least factories, mills, schools, and the halls of tenement houses.

4. Legislative provision for State Medical Inspectors, responsible to the State Board of Health, each in charge of a district within which he supervises organized work.

5. Each community in the organization should have such force of nurses, visitors, or both as each may need; that the poor may be followed up in their homes, taught what to do, helped to do it, if necessary, and encouraged to persevere in doing it. Much of this can be done without, or with trifling, expense. There is much intelligent energy running to waste which can be turned in this direction.

All the above recommendations are made by the State Commission to investigate measures for the relief of consumption. Their report should be read and pondered by every physician.

Immense service can be rendered by arousing the interest of private and incorporated employers of labor in mills and factories. When the example set by the A. L. Joslin Co. in this State and by the Sharpe & Brown Co. and Mr. Metcalf in Providence at the instigation of Doctors E. P. Joslin and Fulton is generally followed, the mortality returns will tell the story, and there is no reason why it should not be followed if we physicians do our duty. Mill owners and managers are as a class intelligent and humane. Let their

physicians call attention to this matter. It is highly probable that there will be no economic loss to the employer. There is more likely to be a gain to him, and the gain to individual workers, as well as the community, is sure to be great.

The tuberculosis exhibitions which have been held are potent aids in teaching the public the possibilities of prevention and cure. Such exhibitions should be brought within reach of the great majority of the inhabitants of the State. While the campaign is primarily against tuberculosis, success in its prosecution must indirectly diminish the liability to, or serious effects of, many other diseases more or less intimately dependent on impaired vitality.

Past experience proves that the mortality from tuberculosis can be greatly reduced. There are those who go so far as to say that a systematic and energetic fight will render tuberculosis as rare as leprosy. Unless a vaccine comparable to that for small-pox, or some other means producing artificial immunity, can be discovered and universally applied, the above view would seem too sanguine. The problem of leprosy was a relatively simple one. That disease is far more difficult to transmit from one individual to another than is tuberculosis. Its lesions are mainly external and it is thus more easily recognized. The segregation of leprosy carried out during the Middle Ages could thus yield results hardly to be hoped for in the case of tuberculosis, an adverse factor in the attempt to stamp out which lies in that, unlike most of the more acute infections, it can be carried and perpetuated by a number of domesticated animals—cats, dogs, rabbits. The tubercle bacillus is being put on the defensive and we can be sure will fight for his life just as we are fighting for ours. Is it not possible that more resistant and virulent strains may develop, if not wholly, at all events partly, in proportion as we develop immunity? That nature is very careful of the species

while seemingly regardless of the individual is as true of a bacillus as of larger organisms. Man has totally exterminated the great auk. The Labrador duck has utterly disappeared since 1860 without any assignable cause. The bison and the wild pigeon have practically disappeared. Animals which breed slowly, are defenseless, and like the bison, require vast tracts of land coveted by civilized man, are handicapped in the struggle for existence. I am told that the few herds of bison which are preserved only just about hold their own, showing very slight, if any, tendency to increase. The balance of nature is very complex and may be very delicate. It does not seem probable that the disappearance of the wild pigeon, such enormous flocks of which still existed easily within the memory of many of us, can be attributed save in subordinate part to their slaughter by man. The part played by man in the extinction of the bison is probably larger than in the case of the pigeon. The preserved herds of bison are well cared for but can no longer migrate. Why do not they increase under protection as do moose and the white-tailed deer? Is it not possible that these beings had about reached their limit of adjustment to external conditions and that any slight change in the balance against them was too much for them? Our lives, and even the written records of man, are so short, and it is so hard for us, busy with our daily struggles, to project our thought and imagination far enough backward or forward. Man himself is a mere babe in arms in comparison with life on this planet, and his parasites in their present form must be younger still. The destructive moths which have caused so much trouble in these parts of late years find no adequate natural enemies in this country. In Europe they ordinarily are kept within bounds, but even there they now and then get ahead of their enemies for a time by reason of some change in the balance.

This line of thought may not be practical. It certainly

does not materially influence action now or in the immediate future, but it seems to me deeply interesting and wholly pertinent to our subject of the evening. There is no tendency to race suicide in the tubercle bacillus. He finds an acceptable *habitat* in man, whose numbers are increasing, and whose tendency in civilized countries to form large communities runs directly counter to some of the measures which he takes to protect himself against the bacillus. We know that we are decreasing and can further diminish the mortality of tuberculosis. Can we correspondingly decrease the morbidity? I doubt it. Tuberculosis seems likely to persist for a long time to come, perhaps indefinitely, in latent, more superficial, milder and more chronic forms. There can be no question that there are many persons—in all probability there are some such in this very room—who have or have had tuberculosis, even of the lungs, and who tolerate or have recovered from it without knowing that they have, or have had it. Here again comes in the distinction of Theobald Smith between infection and disease. It is mainly to his suggestion that I owe the above line of thought.

If the master-word in medicine is work; that in the tuberculosis fight is education. Every teacher knows this to involve work—hard work. To paraphrase Talleyrand's definition of the main requirement of the diplomatist we can say "de l'éducation, encore de l'éducation, toujours de l'éducation."

The effort to compress so large a subject into reasonable limits has not been an altogether easy one. I trust that my sins of omission and commission may not be as obvious to you as they are to me.









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